AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An apparatus for estimating frequency errors ~~in a locally generated clock signal for~~ in a local oscillator signal used in GPS receivers, comprising:

a local oscillator for generating the ~~locally generated clock~~ local oscillator signal and a sampling clock signal, wherein the sampling clock signal is derived from the local oscillator signal;

a sampling block coupled to the local oscillator, ~~for receiving a discrete, non-continuous~~ that receives an external reference signal with a known reference frequency and the sampling clock signal, and ~~for generating reference sample signals~~ generates digital samples of the external reference signal; and

a local oscillator frequency error estimator module, ~~for generating an error estimate between the reference signal and the local oscillator sampling clock~~ that determines a frequency error in the local oscillator signal by comparing respective frequencies of the digital samples of the external reference signal and the sampling clock signal.

2. (Canceled)

3. (Currently Amended) The apparatus of ~~claim 2~~ claim 1, wherein the sampling block comprises a block selected from a group comprising a dedicated analog-to-digital converter and an integrated circuit (IC) input pin.

4. (Currently Amended) The apparatus of claim 3, wherein the local oscillator frequency error estimator module uses an algorithm ~~is~~ selected from a group

comprising ~~a~~ discrete ~~fourier~~ Fourier transform, ~~a~~ frequency ~~detector~~ detection, and ~~a~~ phase ~~detector~~ detection.

5. (Currently Amended) A method of calibrating a local oscillator in a mobile GPS receiver, comprising:

receiving ~~a discrete, non-continuous~~ an external reference signal with a known reference frequency from ~~a~~ an external source providing the external reference signal;

generating the a local oscillator signal;

deriving a sampling clock signal from the local oscillator signal;

sampling the external reference signal ~~and a~~ with the sampling clock signal, thereby generating digital samples of the external reference signal ~~from the local oscillator and providing a second reference signal~~; and

comparing respective frequencies of the digital samples of the external reference signal and the sampling clock signal, thereby estimating ~~the~~ a frequency error in the local oscillator ~~using the second reference~~ signal.

6. (Currently Amended) The method of claim 5, wherein the sampling and frequency error estimation ~~estimating~~ are performed by software instructions to a microprocessor.

7. (New) The apparatus of claim 1, wherein the GPS receiver is integrated with a mobile device.

8. (New) The apparatus of claim 7, wherein the mobile device is a CDMA, GSM, or AMPS cellular phone.

9. (New) The apparatus of claim 1, wherein the local oscillator frequency error estimator module runs on a microprocessor.

10. (New) The apparatus of claim 1, wherein the external reference signal comprises one or more orders of harmonics.

11. (New) The apparatus of claim 10, wherein a frequency of the sampling clock signal is chosen with respect to the reference frequency of the external reference signal, such that after digitization in the sampling block, images of respective frequencies of higher order harmonics with significant magnitude are located far from an image of the reference frequency.

12. (New) The method of claim 5, wherein estimating the frequency error in the local oscillator signal includes using an algorithm selected from a group comprising discrete Fourier transform, a frequency detection, and phase detection.

13. (New) The method of claim 5, wherein the GPS receiver is integrated with a mobile device.

14. (New) The method of claim 13, wherein the mobile device is a CDMA, GSM, or AMPS cellular phone.

15. (New) The method of claim 5, wherein the external reference signal comprises one or more orders of harmonics.

16. (New) The method of claim 15, wherein a frequency of the sampling clock signal is chosen with respect to the reference frequency of the external reference signal, such that images of respective frequencies of higher order harmonics with significant magnitude in the digitized external signal are located far from an image of the reference frequency.